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Kujang and Batik Bogor Educational Games to Grow Millennial Generation Enthusiasm for Local Wisdom Through Digital Media

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Abstract

Educational game is a game that raises local wisdom in which there are values of local wisdom that can be remembered and implemented by users in everyday life. in this educational game made in accordance with the rules needed in the world of education. starting from the elements of game design and techniques used in making games. This application was built using MDLC (Multimedia Development Live Cycle) combined with FSM (Finite State Machine) so that this educational game is very easy to understand and understand by users, especially millennial generation. after the socialization to the millennial generation there was an increase in understanding of the local wisdom of Bogor, especially the Kujang and the batik of Bogor.

Keywords: MDLC,FSN,Education,Game, Kujang,Batik

1. Introduction

Bogor batik is one of the batik motifs originating from the districts and cities of Bogor so that the motivation of the batik is a typical motif of the district and the city of Bogor such as kujang, deer, imah, urug, taro leaf, and other bogor characteristics. in previous studies (Aryani & Anggraeni, 2019) explained that the Bogor batik motif is the Bogor batik motif inspired by the legacy of the Pakuan Pajajaran kingdom, historical objects, phenomena, and culture. One of the famous motifs is the Kujang Kijang motif. Kujang is a traditional weapon from West Java made of iron, brass, copper. cleaver has a variety of shapes and models such as kujang ciung, kuntul, jago, naga, bangkong, badak. at this time cleaver became an icon of West Java, especially the city and district of Bogor (Tosida et al., 2012; 2016).

Kujang and batik Bogor is one of the local wisdoms that needs to be preserved and introduced to all people of the world, Indonesia and specifically to the people of West Java. because, kujang and batik

Bogor is the cultural wealth of West Java, especially districts and cities of Bogor. Such local wisdom must also be introduced to millennials who are considered to be the golden generation in the world and Indonesia, in particular, who are able to be the driving force of change(Rosnidah, Muna, Musyaffi, & Siregar, 2019). in addition, millennial generation is a generation born between 1981 and 2003. They are a generation that likes flexibility, freedom, and also personal matters. Their work attitude is different from previous generations, one of which is that millennials have strong preferences related to the organizational structure and systems that support it.(Setiawan & Puspitasari, 2018).

In the modern era with millennial generation who like flexibility, freedom, and also personal matters, it is necessary to have a learning method that is related to local wisdom, namely how to approach learning through digital media such as game. a lot of research about making games and their applications as in research (Plass, Homer, & Kinzer, 2015; Tsai, Huang, Hou, Hsu, & Chiou, 2016; Zhamanov, Yoo, Sakhiyeva, & Zhaparov, 2018) they say by using educational games each student acquires skills and knowledge that is crucial for the development of an mindset and learning learning environments, multiple perspectives have to be taken, so that they are able to understand conceptually. educational games are also useful to help the blind children to improve their interest and enthusiasm for learning, and increase their understanding of the material presented and give positive impact on the learning process can be achieved, such as higher satisfaction, motivation and greater engagement of students (Sari, Fadillah, Jonathan, & Prabowo, 2019; Urh, Vukovic, Jereb, & Pintar, 2015).

This educational game is a game that raises local wisdom in which there are values of local wisdom that can be remembered and implemented by users in everyday life. in this educational game made in accordance with the rules needed in the world of education. starting from the elements of game design and techniques used in making games. These game design elements include points, levels/stages, badges, leaderboards, prizes, progress bars, storyline, and feedback.(Nah, Zeng, Telaprolu, Ayyappa, & Eschenbrenner, 2014).

After interviews with teachers and distributing questionnaires to 30 students from Citamiang Elementary School about the history of local wisdom, it was found that history lessons Local wisdom is difficult to understand which is possible because of the lack of students' interest in reading history books because it is boring. Solutions that can be found in this is by using a web-based educational game method which is expected to increase students' interest in learning the history of local wisdom. educational game that is made using the Finite State Machine (FSM) method in Action Games Based on Platform Games for Local Wisdom Education Bogor. This educational game is expected to be a learning media that can be a tool to improve student concentration in the learning process, as well as facilitate the understanding of the material because it is supported by more interesting multimedia facilities.

2. Materials and Methods.

2.1. Materials

2.1.1 Education Game

Educational game is a game that raises local wisdom in which there are values of local wisdom that can be remembered and implemented by users in everyday life. in this educational game made in accordance with the rules needed in the world of education. starting from the elements of game design and techniques used in making games. The effect of course type on students' final exam scores was mediated by students' levels of intrinsic motivation, with students in the gamified course showing less motivation and lower final exam scores than the non-gamified class. This suggests that some care should be taken when applying certain gamification mechanics to educational settings.(Hanus & Fox, 2015). Game-like approaches are becoming increasingly popular in education, with educational games and gamification drawing increasing levels of attention, game education suggest that all experimental conditions significantly impact on learning performance, but social gamification returned better results in

terms of immediacy and for all types of assessments. (De-Marcos, Domínguez, Saenz-De-Navarrete, & Pagés, 2014)

2.1.1 FSM (*Finite State Machine)*

Finite State Machine (FSM) is a model commonly used to design intelligent agent behavior in games that has advantages in the simplicity of computing and ease of understanding and implementation. Determination of the state diagram in accordance with the type of behavior that has been determined, with certain conditions that can facilitate the flow of the game. FSM consists of two types, namely FSM with output and FSM without output. FSM is not output used for language recognition in computers, with the input entered will be obtained whether the input is known by computer language or not. One of the uses of non-output (Monga, 2012; Moore, 2016)FSM is the compiler program, which is a program to check whether the command used by the user is true or false. Meanwhile, the output of FSM is used to design machines or systems. And the FSM that will be used in this research is the output FSM, and henceforth it will be written with FSM only.(Mavridou & Laszka, 2018; Moore, 2016; Mytkowicz, Musuvathi, & Schulte, 2014)

2.2. Methods

so that the research objectives are achieved well, in this study using the MDLC (Multimedia Development Live Cycle) method which consists of 6 stages, namely concept, design, material collection, design, assembly, testing and distribution. (Udjaja, Guizot, & Chandra, 2018; Yan, Yang, Lan, & Tong, 2012)

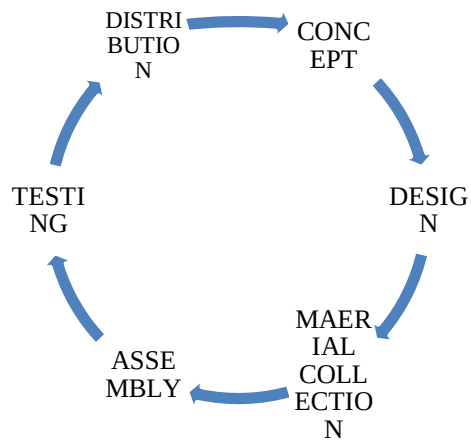


Figure 1 MDLC (Multimedia Development Live Cycle)

2.2.1. Concept

The concept stage is the stage for setting goals, determining the concept of images,provide information on each level, how to use and target users from making games education. In general, the process carried out at the concept stage is determining goals media introduction to local wisdom in the city of Bogor.(Eneng Tita Tosida, Agung Djati Waluyo, 2017; Sánchez-Acevedo, Sabino-Moxo, & Márquez-Domínguez, 2018)

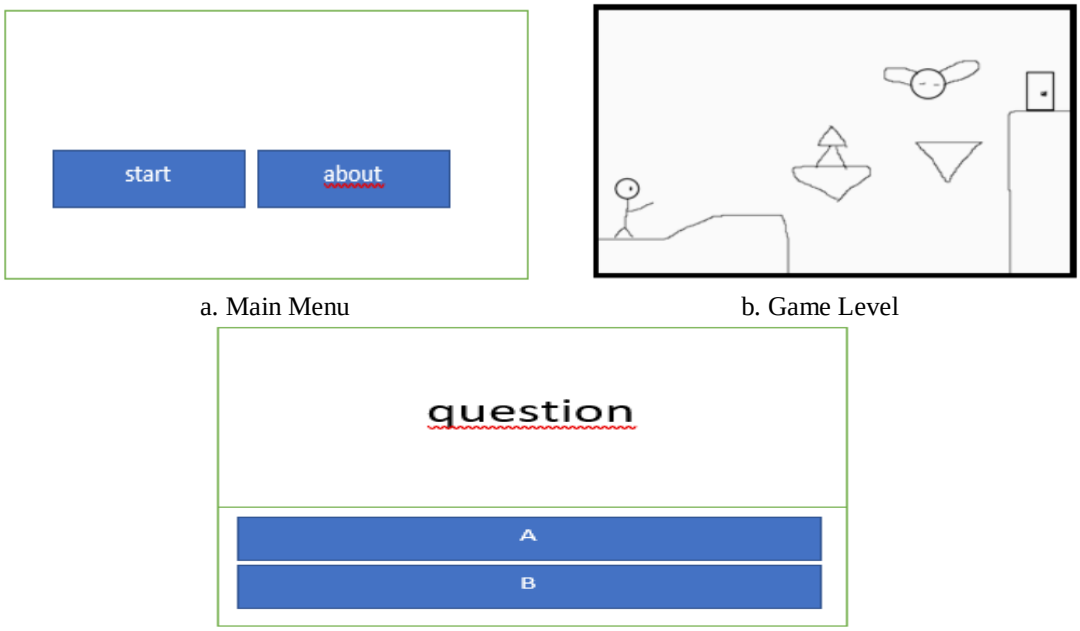
1. The Purpose of Educational Games Bogor local wisdom education game aims to help the millenial generation so that they are more familiar with Bogor's local wisdom and Bogor's unique batik motifs.
2. Determining the Concept of Each Level In making this educational game has 2 levels, each level has a background different games and difficulties. Level 1 is the theme of batik motifs typical of Bogor. Level 2 themed the introduction of cultural villages in Bogor, namely the village of Urug.

3. Concepts of Educational Game Media Contents This educational game media consists of the main menu, about, level 1, level 2 and quiz..

2.2.2. Design

The process carried out at the design stage is storyboard design and flow chart. At the design stage, detailed specifications are needed so that the stages then no doubt and a new decision is needed.(Chen, Liu, Cheng, & Huang, 2017)

1. Application Design is The design of Bogor's local wisdom education game is made into interactive media for make it easier for users and so users do not get bored when learning about history local culture.The design of mobile-based educational games is made so that applications can be run through smartphone to be more practical. in figure 2, is mobile design for the game.



a. Main Menu b. Game Level

c. Game Quiz

Figure 2 Design Education Game

2. Navigation structure is at the stage carried out to determine the flow in the game to be made. the stages can be seen in figure 3.

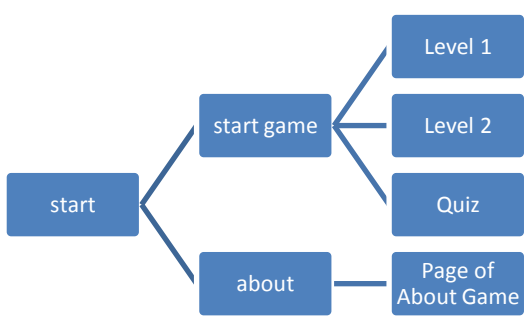
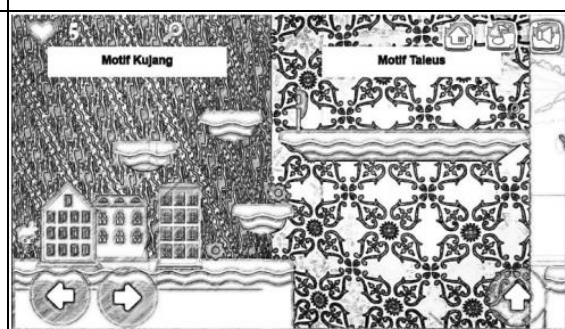
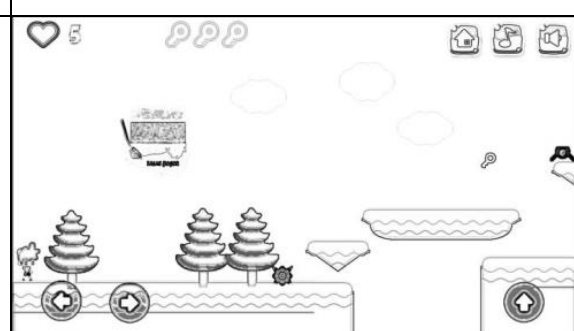
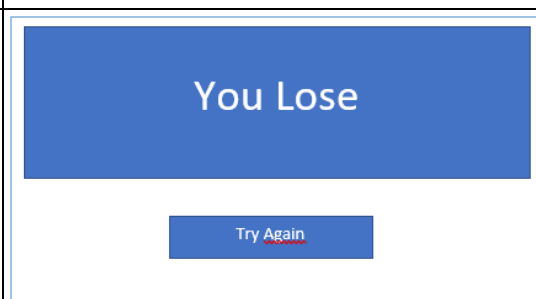
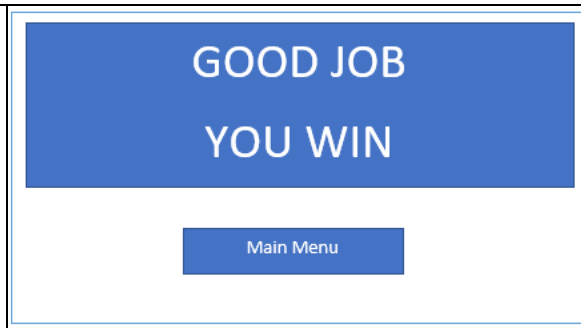
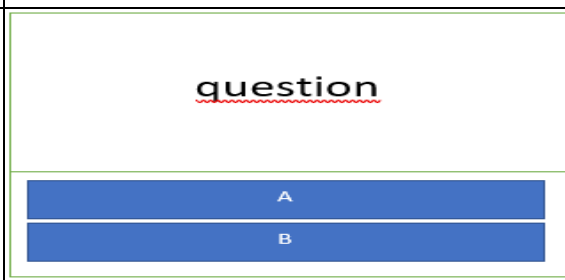


Figure 3 Navigation Structure

3. Storyboard to sketch the application for the purpose of explaining or describe multimedia objects clearly. story board can be seen in Tabel 1.

Table 1 Storyboard

No	Name	Visual Desain	Information
1	Start Page		This display appears at the beginning of the game, on this page the user is directed to use the Play button to start the game
2	Page Level 1		After the play button is clicked it will enter the level 1 page Bogor-themed batik motifs. In level 1, players must search for 3 keys to advance to level 2.
3	Page Level 2		This level 2 page will appear when the player has finished level 1, level 2 is the theme of the village of Bogor Urug.
4	Page If Lose		This page will come out when a user loses while playing a game, The user cannot continue to have to repeat it again

5	Page If Win		This page will come out when the user has completed level 1, level 2 and quis. There is a button to return to the initial menu
6	Page Of Quiz		This display appears when the user has completed level 1 and level 2. On this page the user is directed to complete multiple choice questions.

4. flowchart program is done after knowing the contents of the educational game media. Flowchart program functions to describe the flow of one scene to explain each of the steps in making media logically. Image flowchart program can be seen in Figure 4.

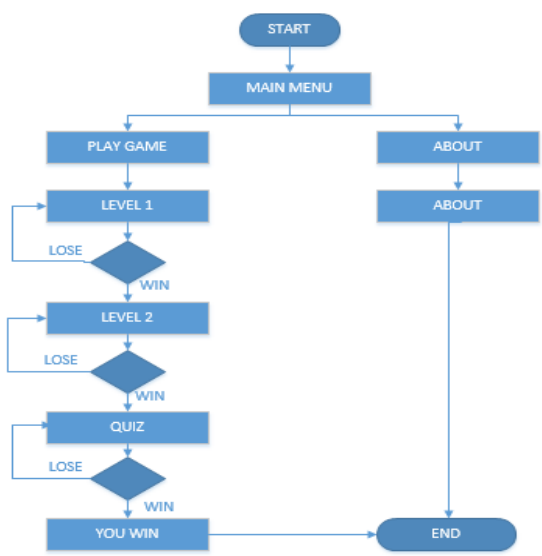
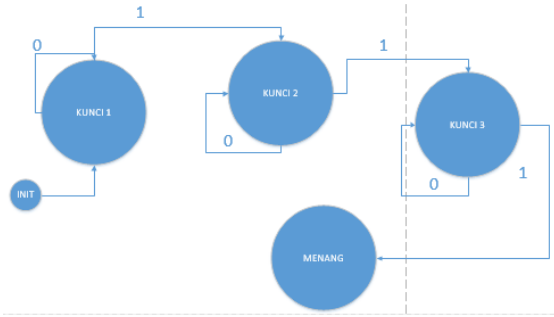
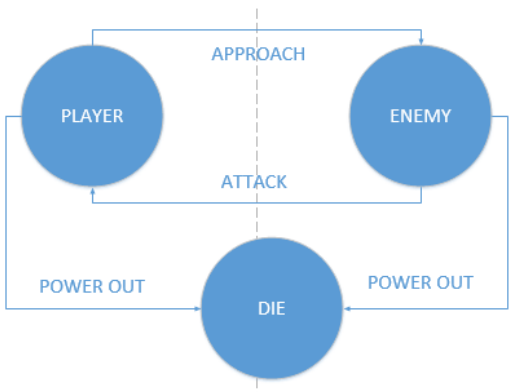


Figure 4 Flowchart

5. Application of FSM (Finite State Machine) in education game there are two step. The implementation of Moore State Machine is applied to the mission to get the keys at level 1 and level 2. The Moore State Machine flowchart picture can be seen in Figure 5.a and The application of Mearly State Machine is to illustrate how the enemy moves. Can be seen in Figure 5.b ("Deterministic Part-of-Speech Tagging with Finite-State Transducers," 2020; Moore, 2016)



a. *Moore State Machine*



b. Mearly State Machine

Figure 5 Implementasi FSN

Information :

a) State 1 is the mission to get the key to 1: if key 1 is obtained without dying, then enter next state 2, and if key 1 has not been obtained then it will remain at the same level.
b) State 2 is the mission to get key 2: if key 2 is obtained without dying, then enter next state 3, and if key 2 has not been obtained then it will remain at the same level.
c) State 3 is the mission to get the 3rd key: if key 3 is obtained without dying, then enter the next level, and if key 3 has not been obtained, it will remain at the same level

If the player approaches the enemy, the enemy will immediately glide towards the player and if the player hits the enemy, the player's life will be reduced. Vice versa if the enemy is trampled by the player to eat the enemy will die.

2.2.3. Material Collecting

At this stage, the collection of materials according to needs is carried out. The results obtained at the material collection stage to support the making of the application are as follows:

1. Bogor Local Shading Material is done by finding some references from books, internet and coming directly to the dayarti batik boutique.
2. Audio is required for background noise in making this application. Audio used along with music and self-made additional sounds.

2.2.4. Assembly

This stage is carried out the process of making a Bogor local wisdom education game in accordance with the navigation structure, flowchart, and storyboard that have been made previously. Broadly speaking this educational game consists of a collection of images, audio and information about Bogor's local wisdom. At this stage, there are 5 steps to be carried out, namely making game assets, making games, making game events, making game coding and converting XML to apk.

2.2.5. Testing

The testing phase is done after completing the manufacturing stage by running the Bogor local wisdom education game and seeing whether there are mistakes or not in the introduction media. There are several stages of testing

1. Testing is done on the application creation software namely Adobe DreamweaverCC and Construct 2 which aims to find out if the points run accordingly.
2. Testing is done on an Android mobile device.
3. testing by giving questionnaires to experts and users whether this educational game is useful for millennial generation.

2.2.6. Distribution

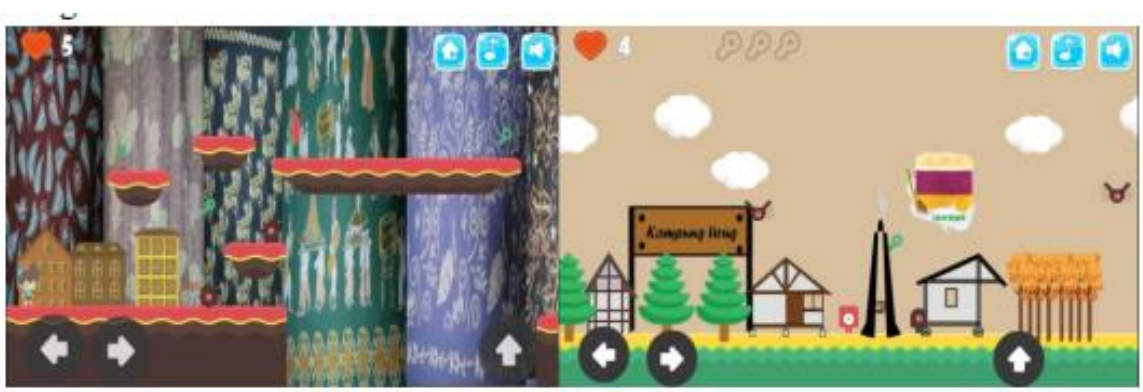
The distribution stage is the stage to introduce this educational game to the public by providing direct counseling and storing applications on google play.

3. Results and Discussion

In the main menu display there are 2 (two) menu choices in the form of buttons namely the menu to start the game and watch a movie. The following is the main menu display can be seen in Figure 6a. After the player clicks on the level, the player will enter and start the game. The skenario namely, players must pass obstacles to find a key and enter the door to get to the next level. The following displays level 1 and level 2 can be seen in Figure 6b and after the player clicks continue, the player will enter and start working on the quiz. The secret is, the player must complete a multiple choice question before time runs out. The following shows the quis can be seen in Figure 6c.

a. Main Menu

c. Game Quiz



b. Game Level 1 and 2

Figure 6 Result Education Game

From the results of tests conducted by giving questionnaires to experts and users using 30 samples, with value 1=super very high, 2=very high, 3=high, 4= low high, 5=not.

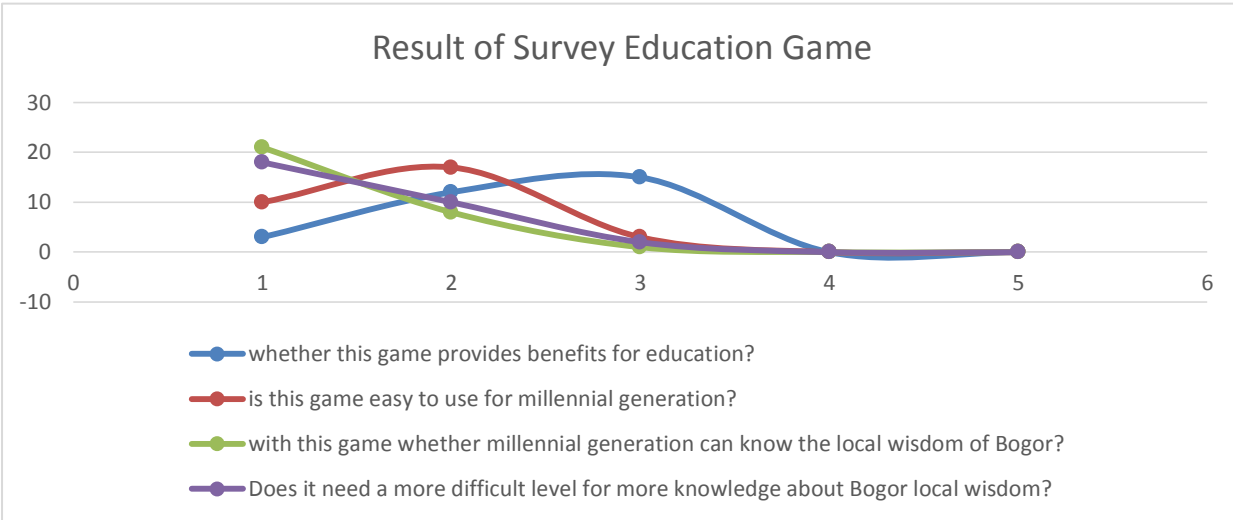


Figure 7 Resul Of The Survey

In the survey activities there were 26 questions summarized in the graph into 4 statements

1. does this game provide benefits for education?
2. Is this game easy to use for millennial generation?
3. with this game whether the millennial generation can know the local wisdom of Bogor?
4. Does it need a more difficult level for more knowledge about Bogor local wisdom ?.

The results for the statement can be seen in Figure 7, so it can be concluded that this educational game is very useful for the world of education, especially for millennials so that millennials can find out more about the local wisdom of Bogor such as Kujang and batik Bogor.

Distribution activities are carried out by saving the application on googleplay. In addition, educational game socialization activities are carried out by coming directly to users, especially millennials such as primary schools in Bogor, by collaborating with the City and Bogor District Education Office related to the socialization of digital learning media for batik and cleaver. The learning media was socialized to the Bogor Education Office and other related parties through elementary schools such as Semeru Elementary School, Ciheulet Elementary School, Amaliah Elementary School, Cibalagung Elementary School, Suka Damai Elementary School and other elementary schools in Bogor. This socialization is intended to foster millennial generation enthusiasm for batik and cleaver through digital media. With the introduction of this media the enthusiasm for Kujang and Batik Bogor is increasing.

4. Conclussion

Educational game is a game that raises local wisdom in which there are values of local wisdom that can be remembered and implemented by users in everyday life. in this educational game made in accordance with the rules needed in the world of education. starting from the elements of game design and techniques used in making games. This application was built using MDLC (Multimedia

Development Live Cycle) which consists of concept, design, material collection, design, assembly, testing and distribution which is integrated at the time of assembly with FSM (Finite State Machine) using two stages namely Moore State Machine is applied to the mission to get the keys at level 1 and level 2 and Mearly State Machine is to illustrate how the enemy moves. So this educational game is very easy to understand and be understood by users, especially millennial generation. after the socialization to the millennial generation there was an increase in understanding of the local wisdom of Bogor, especially the Kujang and the batik of Bogor.

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